

Introduction to financial modeling

Lecture 7

Inference problems

Please find here the links for the background materials. This is only suggestive and by no means complete! If you cannot find/ download any paper, please send us an e-mail with the name of the paper(s).

A. Markov chain Monte Carlo (MCMC)

- An Introduction to MCMC for Machine Learning, C. Andrieu, N. de Freitas, A. Doucet and M.I. Jordan, *Machine Learning*, 50, 5-43, 2003.
http://www.cs.ubc.ca/~arnaud/andrieu_defreitas_doucet_jordan_intromontecarlo/machinelearning.pdf
- Estimation via Markov chain Monte Carlo, J. C. Spall, *IEEE Control Systems Magazine*, 23(2), 34-45, 2003.
http://ieeexplore.ieee.org/xpls/abs_all.jsp?arnumber=1188770

B. Sequential Monte Carlo/particle filtering

For a relatively recent tutorial on particle filtering

- A Tutorial on Particle Filtering and Smoothing: Fifteen years Later, A. Doucet and A. M. Johansen, in *Handbook of Nonlinear Filtering* (eds. D. Crisan et B. Rozovsky), Oxford University Press, 2011.
http://www.stats.ox.ac.uk/~doucet/doucet_johansen_tutorialPF2011.pdf
- Particle Filter Theory and Practice with Positioning Applications, F. Gustafsson, *IEEE AEROSPACE AND ELECTRONIC SYSTEMS MAGAZINE*, **25**(7): 53-81, 2010.
<http://liu.diva-portal.org/smash/record.jsf?pid=diva2:360880>

C. SMC/particle filtering in finance

- Particle Filters and Bayesian Inference in Financial Econometrics, H. F. Lopes and R. S. Tsay, Journal of Forecasting, 30, 168-209, 2011.
<http://faculty.chicagobooth.edu/Hedibert.lopes/research/pdf/lopes-tsay-2011.pdf>
- A survey of sequential Monte Carlo methods for economics and finance, D. Creal.
<http://dare.uvu.vu.nl/bitstream/handle/1871/15287/20090018.pdf;jsessionid=CBDCF847E4F1A4385DF0F223488DBBB5?sequence=2>

D. Variational Bayesian inference

- A Tutorial on Variational Bayesian Inference, C. Fox and S. Roberts.
http://www.robots.ox.ac.uk/~sjrob/Pubs/fox_vbtut.pdf
- The Variational Approximation for Bayesian Inference, D. G. Tzikas, A. C. Likas, and N. P. Galatsanos, IEEE SIGNAL PROCESSING MAGAZINE, 25(6), 131-146, 2008.
<http://www.cs.uoi.gr/~arly/papers/SPM08.pdf>